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ANNUAL FORAGES FOR PASTURE

Susan Robinson and **Stephen Clare**,
Plant Industry Branch, North Bay
(Replaces Publication 41, "Annuals for Supplementary Feed")

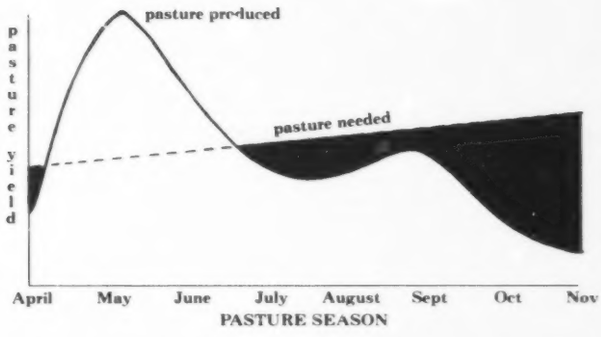

Figure 1. The typical pattern of pasture production during the grazing season.

Figure 2. Well-managed permanent pastures and annual forage crops can provide pasture from early spring to late fall.

Annual crops can play an important part in pasture production. These crops can be part of the planned program or an emergency remedy to provide forage after winterkill of perennial species. While annual crops offer flexibility in pasture programs, their advantages must be weighed against the cost of seeding each year. To minimize these seeding costs, ensure that your permanent pastures are utilized completely.

Permanent pastures in Ontario show a pattern of production similar to that in Figure 1. There is a burst of growth in the spring, often providing more forage than can be grazed, followed by a steady decline in productivity as the hot dry weather arrives. With the cool, wet weather in the fall, there is some recovery, but normally a pasture shortage still exists. These shortages can be filled by selecting perennial forage species that yield well in the summer and the fall, fertilizing grass pastures with split applications of nitrogen and using proper grazing management.

Grazing is hard on plants. It reduces their ability to manufacture food which in turn affects their leaf and root growth, further tiller development and energy reserves. The severity of these effects is determined by the number of leaves removed. Permanent pastures grazed to 2.5 cm produce much lower seasonal yields than pastures grazed just to 10 cm. Closely grazed fields take much longer to recover and regrow which contributes to low mid-season production.

Proper grazing management is also important from the standpoint of the animal. Cattle graze best when the forage is 10 to 15 cm tall while sheep should graze forage that is taller than 6 cm. Palatable, succulent, immature forage is consumed in greater quantities than more mature forage and provides greater weight gains and milk production. Keeping pastures in immature stages of growth is essential and is only possible when some system of clipping, rotational or strip grazing is used. A good pasture, properly managed, may have 25% of its area not needed for grazing in early June. Such excess herbage may be harvested at that time as silage or hay. Forage preserved in such a manner can be used as a pasture supplement later in the season if a lack of moisture limits pasture growth.

Several forage annuals, as shown in Table 1 are available for filling in production gaps and extending the pasture season.

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Table 1. Annual Forages Fill the Pasture Season

Annual Forage	April	May	June	July	Aug	Sept	Oct	Nov
Oats*			———	———	———			
Barley			———	—				
Fall Rye	———	———						
Winter Triticale	———	—						
Annual Ryegrass**			———	———	———	———	———	———
Sorghum-Sudan grass					———	———		
Sudan grass					———	———		
Millet					—			
Rape							———	
Kale						———	———	
Stubble Turnips						———	—	

**Oats can be seeded throughout the season to provide pasture 6 weeks later.*

***Production depends on adequate moisture conditions.*

SPRING CEREALS

Cereals are annual grasses and can be used as pastures. Any of the cereals grazed early enough (when vegetative) will show some regrowth. In the vegetative stage they are a good source of protein but have a very low dry matter and fiber content. Dry hay should be provided as animals cannot obtain enough energy or fiber from grazing young cereals alone. To avoid having to supplement with hay, delay grazing until stems have formed on the cereals.

Cereals tend to be nitrate accumulators. If large amounts of nitrogen fertilizer are applied during cool growing conditions or cloudy periods, the plants may accumulate levels of nitrates that are toxic to grazing animals. To prevent this, limit nitrogen applications to 30 to 50 kilograms of nitrogen per hectare.

Cereals produce the maximum amount of forage when seeded and fertilized for good grain yields. See OMAF Publication 296 *Field Crop Recommendation* for details on fertilizer rates.

The cereals differ in productivity, palability and feed value. Oats are generally more palatable than wheat, barley and rye and are the preferred spring cereal.

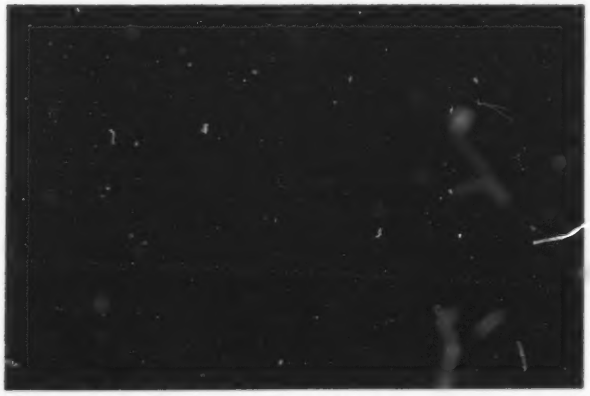

Figure 3. For best animal performance graze cereals when they reach 20 cm in height but before they head out.

OATS

Oats are ready to be pastured 6 to 8 weeks after being seeded and can be seeded anytime from spring to fall. Early spring seedings can be cut for hay and the aftermath grazed until fall. Seed at 65 to 80 kg per hectare.

Oats As a Companion Crop

Oats, when grown as a companion to an establishing forage crop, provide an additional source of early summer pasture. The oats should be seeded at a low rate, 30 to 40 kg per hectare, and grazed when 20 cm tall. This practice not only provides good pasture but also helps the establishing forage crop by eliminating the competition from the oat crop. This allows the young forage plants to grow more vigorously and consequently establish a thicker, higher yielding stand. Care should be taken so that animals do not graze the young forage plants.

SPRING BARLEY

Barley is higher yielding than oats but less palatable when grazed, so is better used as green chop or silage. Maximum yields occur when the plant is in the dough stage. Seeding rates are 100 to 110 kg per hectare.

WINTER CEREALS

Fall Rye

Fall rye is a versatile pasture crop. It can be grazed in the fall and spring if seeded before August 15. The fall growth can be grazed until snow cover. Fall rye can provide very early spring pasture if seeded on land that dries out quickly. The land must be firm enough in the spring to carry the livestock. Rye that is to be grazed in the spring should be fertilized in the spring with 50 to 80 kg of nitrogen per hectare just when the rye starts to turn green. Rye that is grazed early and has the animals taken off before it starts to mature can still produce a grain crop if growing conditions are good. This crop matures extremely rapidly after mid-May and careful attention to stage of crop growth is needed. Seed at 150 kg per hectare and fertilize to soil test recommendations.

Winter Triticale

Winter triticale is a cross between wheat and rye that provides early spring grazing. It can be grown on a variety of soil types but like fall rye should not be sown on poorly drained soils.

Winter triticale should be seeded early enough in the fall to provide time for the crop to get established. The date of seeding varies with location. Refer to OMAF Publication 296 *Field Crop Recommendations* for further details. Seed winter triticale at a rate of 100 to 125 kg per hectare. In the spring, as the winter triticale is starting to turn green, fertilize with 80 kg of nitrogen per hectare. More information on winter triticale can be found in OMAF Factsheet *Winter Triticale in Ontario*, order number 83-049.

ANNUAL RYEGRASS

Annual ryegrass can be used to produce top-quality forage for pasture or stored feed from mid-summer to late fall. Annual ryegrass is ready for use about six weeks after seeding and regrows continuously if it receives enough rainfall. The major limitation to the use of annual ryegrass in Ontario is the requirement for a constant supply of water. The shallow root system of annual ryegrass makes it ill-equipped to find water reserves when

rainfall has been scarce. During periods of little or no rainfall, the plants stop growing and may die.

Two types of annual ryegrass are available – Italian and Westerwolds. Italian ryegrasses are leafy, short growing (up to 40 cm) and do not come into head, which makes them ideal for pasture. They are extremely difficult to cut. Westerwold type annual ryegrasses grow taller (40-80 cm), have more stem and will head if left to grow. Westerwolds produce the highest quality if cut just at or before heading and are best used in a system where they can be cut regularly.

For maximum yield and quality, annual ryegrasses require top management. Seeding should be done in early spring using a drill or cultipacker-type seeder to place 25 kg/ha of seed 1 cm keep. High soil fertility levels are preferred for maximum production. Fertilize according to a soil test. The seedbed must be rolled well to ensure good emergence from the light, fluffy seed of annual ryegrass.

To produce high yields, annual ryegrass needs regular fertilizing with a high-nitrogen fertilizer. High rates of nitrogen split in 3 applications are required to maintain regrowth and quality if sufficient soil moisture is present. Consult OMAF Publication 296 for the appropriate nitrogen rate.

Sorghum-Sudan Grass Hybrids

Sorghum-sudan grass hybrids can be used for pasture, green chop, or silage. When pastured, the grazing should start after the plants have reached a minimum height of 75 cm in order to maintain production and eliminate the danger of prussic acid poisoning. All members of the sorghum family contain dhurrin, a gluocide that breaks down to release prussic acid (also called hydrocyanic acid). Normally the amount is not enough to cause problems. However, young plants, plants suffering from drought or plants which have been frosted contain a much higher level of prussic acid than normal. The crop should not be grazed when it is recovering from a drought stress or until the frosted plants have dried completely.

Sorghum-sudan grasses grow and develop very rapidly once they have reached a height of 90 cm. Good management is necessary to keep ahead of the growth. Successive plantings, strip grazing, or mechanical harvesting may be required to avoid oversupplies of overmature forage. Strip grazing is the best approach to pasture management as it reduces losses due to trampling.

Green-chopping is an alternative method of using this crop. This eliminates the need to set up fences to allow grazing. Green chop harvest should start when the crop is 90 cm high.

Sorghum-sudan hybrids can be stored as silage, but they should not be considered a substitute for corn silage. On the average, sorghum-sudan hybrids silage contains 10% less TDN and about the same amount of protein as corn silage. The use of sorghum-sudan hybrids for silage should be limited to situations where a surplus of the crop exists, and storage as silage will eliminate its waste.

The crop can be harvested as hay; however, because of its thick stems and high moisture content, curing is very difficult.

The yield from sorghum-sudan grass hybrids is normally lower than corn but higher than sudan grass. Optimum production is obtained under warm, moist conditions. Sorghum-sudan grass hybrids should be planted during the last part of May or early in June at 14 to 20 kg per hectare. Use the lower rate when seeding in 18 or 36 cm drill rows. The higher rate is for broadcast plantings. Fertility requirements are similar to corn.

SUDAN GRASS

Sudan grass grows best on medium and well drained soils. It does not do well on soils that are cold and wet and is **not** recommended for Northern Ontario.

Sudan grass makes very palatable pasture and can be grazed even after heading. Start grazing when the crop is 45 to 60 cm tall as this practice permits fast recovery of the aftermath. When coupled with some form of rotational grazing, it will keep the growth young and succulent throughout the season.

Sudan grass, like sorghum-sudan grass hybrids, contains prussic acid which is poisonous to livestock. To eliminate the danger of poisoning the crop should not be grazed until it reaches 45 cm in height, or when it is recovering from drought stresses. Also wait a week after a frost before grazing.

Seed sudan grass at a rate of 14 kg per hectare in 18 or 36 cm drill rows.

MILLET

Millet is most useful as a hay crop but can be used for pasture or green chop. The yield is slightly less than sudan grass and is not as palatable. Foxtail millet is preffered to other millets. Many farmers prefer millet because it does not contain prussic acid, making grazing management easier. Seed at a rate of 14 to 20 kg per hectare from early June to the beginning of July.

FORAGE BRASSICAS

Good pastures from September to December can be provided by forage brassicas. Forage rape, kale and stubble turnips can be used. The first two are preferred by both sheep and cattle. Forage rape will taint milk and lamb meat if it is the sole item in the animal's diet. Lambs being finished should receive grain along with the rape or following pasturing rape for two to three weeks.

The brassicas should be seeded in well-drained fields which have a pH of at least 6 and adequate fertility. Crops planted on poorly drained soils do not do well and grazing losses are very high. All three species are small seeded and produce maximum yields when precision drilled into rows no more than 1.5 cm deep. Growth will slow or stop if summer conditions are droughty.

All these types of brassicas should be strip grazed to avoid excessive wastage. In addition, because of the brassicas' high moisture content (generally 85-89%), hay should be provided to keep the fiber in the diet.

Kale

Kale (also called marrow stem kale) has a short (75 cm - 1.5 m), upright growth habit with highly digestible leaves and stems. Kale will grow in hot conditions but grows best in cool, moist conditions. It is frost hardy and will continue to provide fresh forage after snowfall.

Kale should be seeded in early June. Because kale grows slowly after seeding, good weed control is essential during the early growing season. Best yields are obtained when kale is drilled in rows 15 to 70 cm wide at a seeding rate of two to four kg per hectare. Kale is small seeded so should not be seeded deeper than 1.5 cm. Kale can be broadcast seeded but the seeding rate should be increased to six kg per hectare. It requires approximately 80 to 120 kg of nitrogen per hectare and grows well if manure is used.

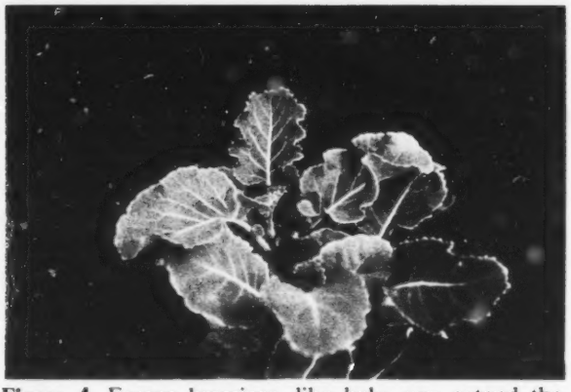

Figure 4. Forage brassicas, like kale, can extend the grazing season into late fall.

Forage Rape

Several types of forage or fodder rape are available although only one forage rape variety (Barcoli) is currently registered in Canada. Broadleaf or giant types are leafy and upright growing and are best pastured by cattle or sheep. Dwarf types are shorter and branching and may be used for lamb fattening. **Forage rape should not be confused with oilseed rape or canola.**

Rape should be seeded in early July for grazing from September to November. For maximum yields, rape should be drilled in 50 to 70 cm rows at two kg per hectare. Rape can be broadcast seeded at six per hectare but yield will be lower. Rape requires approximately 80 to 100 kg of nitrogen.

Rape poisoning can occur if stunted, low growing, purple colored plants are pastured. These crops occur more frequently in wet years, on poorly drained land and when inadequate fertilizer is used. Early frost may aggravate this condition on wet, poorly drained fields.

Cattle can bloat on rape. When grazing rape always have dry feed present to prevent cattle from becoming extremely hungry and eating large amounts of rape. Keep cattle full before putting them on rape for the first time.

Forage Turnips

Forage turnips (also called stubble turnips, fall turnips, white turnips or Dutch turnips) produce a thick mass of bushy tops and large white roots. These roots may be loosened during grazing but will not be wasted if good grazing management is practised. Plant the same as rape and fertilize with 100 kg of nitrogen. Turnips are lower yielding than either rape or kale.

Fodder turnips (white flesh) should not be confused with horticultural rutabagas (yellow flesh).

Hybrids of turnips and other members of the brassica family are becoming available. These crops are leafy and may be grazed several times during the season.

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